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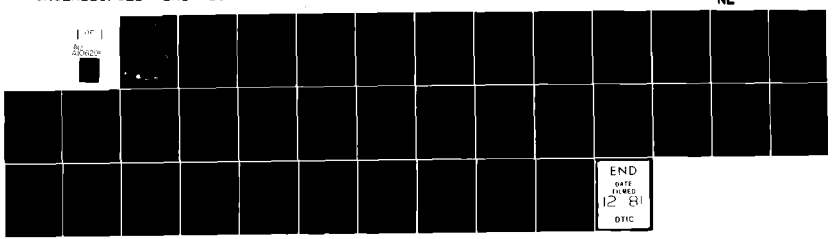

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INSTITUTE REPORT NO. 103

NUTRITIONAL EVALUATION OF MEALS CONSUMED IN THE MILITARY DINING HALLS AT TWENTY-NINE PALMS MARINE CORPS BASE FOR BOTH THE CONVENTIONAL *RATION*/SHORT ORDER AND THE NEW "RESTAURANTS" CONCEPT OF MILITARY FEEDING

Recommendations to Correct Deficiencies

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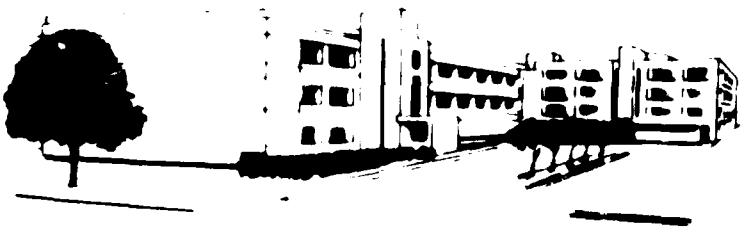
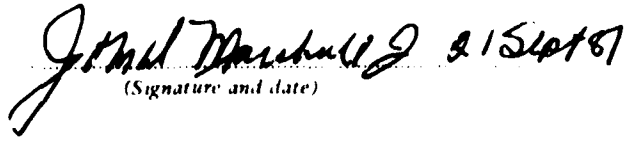
SEPTEMBER 1981



LETTERMAN ARMY INSTITUTE OF RESEARCH PRESIDIO OF SAN FRANCISCO CALIFORNIA 94129

Nutritional Evaluation of Meals...Twentynine Palms Marine Corps Base. Recommendations to Correct Deficiencies--Johnson et al



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The effects of changing the military feeding system upon the quantities of nutrients consumed by the Marine in the military dining hall were assessed by conducting a before-and-after study at Twentynine Palms Marine Corps Base. The first phase was an 8-day survey of the conventional feeding system in a Force Troops' dining hall and a 7-day survey in the Communications and Electronics School dining hall. Low concentrations of iron and vitamin A per 1,000 kcal and a high

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Item 7 (continued)

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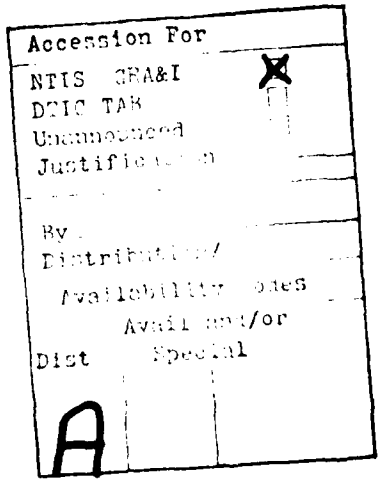
ABSTRACT

The effects of changing the military feeding system upon the quantities of nutrients consumed by the Marine in the military dining hall were assessed by conducting a before-and-after study at Twentynine Palms Marine Corps Base. The first phase was an 8-day survey of the conventional feeding system in a Force Troops' dining hall and a 7-day survey in the Communications and Electronics School dining hall. Low concentrations of iron and vitamin A per 1,000 kcal and a high consumption of calories per meal were the major observations of this feeding system. Then, this feeding system was converted to a series of restaurants, two in each of the four dining halls. Each restaurant had a distinct menu and decor/theme. The second phase of the study was conducted after the novelty of these changes had subsided. Then the effects upon both students and Force Troops were studied. Vitamin A and iron concentrations were low in most meals; the concentrations of thiamin, riboflavin, and ascorbic acid were also low in many of the meals. Recommendations include monitoring nutritional status of Marines, improving nutrient consumptions through nutrition awareness and education, revising menus, fortifying foods, preparing foods so they do not lose their nutrients, and making more nutritious foods more attractive.



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The Department of Defense must maintain the capability for providing complete subsistence to combat personnel during actual conflict and during training under simulated combat conditions. To maintain supply channels for food and an experienced corps of trained food service personnel, garrison feeding for enlisted personnel is provided at installations. Prior to the inception of the all volunteer Army, unmarried enlisted personnel were dependent upon military dining facilities since they did not have the funds or the liberty to seek other sources of sustenance. These personnel were authorized free meals in the military dining facility and received about 90% of their nutrients from this source. When military pay was increased in order to recruit adequate numbers of personnel for the services, these personnel had more of a civilian-type lifestyle. Therefore, the dependence upon the military dining hall was decreased. As a result, the controls over the nutrient intake were also decreased.

The drastic reduction of dining hall utilization has created many concerns within the military command structure. One of the concerns is how to maintain the capability for combat feeding of all DOD personnel including the navy afloat. A second concern is the question of how to insure that the individual enlisted person is receiving adequate nutrition.

Previously, the military menu was developed in relationship to requirements and since the personnel received the majority of their nutrients from the dining hall with minimal choices besides rejection, military commanders were well assured that the health of these personnel was not being adversely affected by poor nutrition. In addition to the drastic reduction in amounts of nutrients consumed in the military dining facilities, several factors have contributed to the deterioration of the nutritional adequacy of the meals consumed in these dining halls. The first factor was the addition of a short order line in the dining hall. Then most of the dining halls started increasing the number of items available for each course. Now some of the dining halls are being converted to specialty type restaurants. All of these changes in DOD feeding systems were designed to encourage increased utilization of the dining hall by enlisted personnel and to improve his/her opinion of military service. Minimal or no concern for the nutritional adequacies of the menus was given in the new plans.

If the military services are going to expect high levels of physical and mental performances from personnel, it remains imperative that the personnel maintain optimal mental and physical conditioning which

includes proper nutrition. These factors could provide the margin between success or failure of a military action and/or could affect the duration of the activity through the quality, quantity, and duration of efforts expended. Since free lifetime health care is provided to the career military person and his/her family, providing good nutrition and sound nutritional information to improve their nutritional status and health would reduce their health care needs and consequently the costs borne by the military services and taxpayers.

Most of the changes in both the military feeding systems and the menus in these dining facilities are being made in response to the desires expressed by the military patrons. Consequently, the nutritional quality of the meals consumed in the military dining hall is no longer maintained by the master menu. This controversy between attempting to increase dining hall utilization by providing popular food items versus the military's responsibility for maintenance of the health of the military person to include proper nutrition is a legitimate predicament. Should the military services ignore their responsibilities for the enlisted person's health in order to have him/her utilize the dining hall more? Will menu changes affect attendance at the dining hall and/or the patron's health? If the enlisted person does not eat in the dining hall, the nutritional quality of the meals available is inconsequential. Therefore, it is important both to increase dining hall attendance and maintain the nutritional quality of the meals. If the person will eat in the dining hall, he/she could be encouraged to consume a well-balanced diet or food items could be fortified to assure adequate intakes of micronutrients. Since these personnel have such a large variety of foods available from both the military feeding system and all other sources, it has become increasingly imperative to monitor the nutritional intakes and status to assure their health and capabilities to perform optimally their military duties in the event of a conflict.

The Marine Corps submitted in March 1974, a request to the DOD Food Research, Development, Testing and Engineering Program for the "Analysis of Marine Corps Food Service System" (Requirement No. USMC 7 -1). This request included a thorough analysis of the present food service system at Marine Corps Base, Twentynine Palms, California, and the development of alternate systems to improve customer acceptance and to increase efficiency and economics of military feeding. Operations Research and Systems Analysis Office (OR/SA) of the U.S. Army Natick Research and Development Command (NARADCOM) submitted plans for initiating a study of the food service system with a request that a study of the nutritional impact of the changes be assessed by Letterman Army Institute of Research (LAIR). The Fourth Annual Meeting of the Joint Nutrition Research

Planning Board (JNRPB), conducted 27 - 28 April 1976, assigned a high priority to the Twentynine Palms study.

OR/SA's plans were a multi-phase, several-years' effort. They included a study of the present system and its patrons' desires regarding feeding systems, designing a new system for the Marine Base, and implementing the new system. In order to assess the nutritional impact of changing feeding systems upon the nutritional intakes and status of the Marine, LAIR conducted a two-phase study at Twentynine Palms Marine Corps Base. The first phase of the Marines feeding system was conducted during March 1977 on the conventional Marine Food Service System while the second phase was conducted during October-November 1978 after a system of restaurants had been operational for several months on this Base. This provided before-and-after comparisons of the nutrient consumptions of these Marines. Although these studies were multifaceted, this report will be restricted to the nutritional evaluations of the meals consumed in the military dining halls.

METHODS

The first phase of the study included an eight-day survey of a Force Troops' dining hall followed by a seven-day survey of the students' dining hall in March 1977. Total amounts of each food served at each meal were determined by weighing all foods brought to each serving line (each serving line independent of the other except when menus were the same at breakfasts) and all foods returned to the kitchen. Samples of individual food items were collected (1) from each serving line. Plate wastes for each food were determined by collecting each food item in a separate container and weighing the total amount of each item for each meal. When the same food item (e.g. salads and desserts) was served on both serving lines, the waste was allotted to each line in the same ratio as it was served (i.e., if 30% of the cake was served on the short-order line, then 30% of the cake waste was allotted to that line).

The total number of people eating the meal in the dining hall was determined from the sign-in sheets. A separate headcount was taken of the short-order patrons; however, valid nutrient consumptions could not be calculated separately for short-order and main-line meals during the first phase due to the large number of patrons returning for second helpings mainly from the short-order line, although their first plate may have been obtained from either line.

The second phase of the study was conducted during October - November 1978 after the Marines had become accustomed to the new feeding

sytstem. In this system, each half of each dining hall had a distinct decor and menu so that the Marines had a series of individualized restaurants from which to choose. To evaluate the nutritional contents of the meals consumed in different restaurants, both serving lines from three dining halls were studied by the same methods as were used for the first phase of the study. The first dining hall was studied for 7 days and was serving the A-ration menu and barbecued short-order foods in the two respective restaurants (Lodge and Barbecue Ranch, respectively). The second dining hall was monitored for 5 days and offered a hamburger and a steakhouse menu in the two separate serving areas (29 - Burgers and Meating Place, respectively). The third facility was surveyed for 6 days and offered an A-ration and an Italian pasta menu in the two respective dining areas(Sports Circle and Pasta Palace). Although the Marines were permitted to attend any of the dining halls, the first two facilities surveyed were located in the Force Troops area while the third was in the students area and most Marines attended the one located in their respective areas.

These data, after assigning food item code numbers, were processed using computer programs and handbook values for nutrient contents (1). Although the average amounts of nutrients could not be obtained for each serving line for the first study, the nutrient concentrations (i.e., % kcalories from fat or milligrams of nutrient per 1,000 kcal) were calculated separately and compared.

RESULTS

The daily dietary nutrient allowances (2) are presented in Table 1. These daily allowances for men are divided by 3 to provide a per-meal standard for comparisons. (It should be noted that the allowances for women never exceed those for men, so that by using men's allowances for each nutrient, the allowances for women should be assured.) As a further comparison of the nutritional balance of the meals, vitamin and iron concentrations per 1,000 kcal or nutrient densities have been calculated. Protein should provide 12.5% of the kcalories for men and 14.5% of the total kcalories for women to meet their respective protein allowances without exceeding the caloric allowances.

The average nutrient consumptions per patron at the Force Troops Dining Hall for the first study are presented in Tables 2 through 4. Average attendance at these meals ranged from 308 for weekend suppers to 472 for weekday lunches with 36 to 37% of the patrons eating short-order meals. The data for the combined meals (short-order plus main line or A-ration) are presented at the top of the tables and the data for the individual lines are shown at the bottom. All of the nutrient

consumptions with the exception of niacin at the breakfast meals, exceeded one-third of the daily allowances and were greater on weekends than during the week. The caloric distributions (Table 4) indicate that protein levels were adequate; however, fat intakes were high, ranging from 41 to 48% of the calories. Calcium to phosphorus ratios ranged from 0.66 to 0.81. Most of the vitamin A and all of the iron values were low, especially for women. All of the averages for thiamin (except weekday suppers), riboflavin, niacin (except breakfasts), and ascorbic acid were adequate in relationship to calories.

The average nutritional contents of the meals consumed in the Student Dining Hall for the conventional Marine feeding system are summarized in Tables 5 through 7. Average headcounts in this dining hall ranged from 902 to 966 during the week, but was lower (775 for breakfasts and 570 for suppers) on the weekends. From 43 to 50% of the lunches and suppers were obtained from the short-order line. The average consumptions per meal exceeded one-third of the daily allowances for all nutrients except for vitamin A and niacin in the breakfasts. The percentage of calories (Table 7) present as protein in many of these meals was less than the 14.5% recommended for women. The averages for fat ranged from 39.2 to 46.5% of the calories. Essentially, all of the vitamin A and iron concentrations, niacin in the breakfast meals, and ascorbic acid in the A-ration suppers were low.

After conversion of the dining halls to two "restaurants" each, the average nutrients consumed per meal and the nutrient concentrations of meals served in the first facility surveyed are shown in Tables 8 through 10. Headcount averages ranged from 396 on weekends to 414 during weekdays for breakfasts, from 76 on weekends to 440 (56% short-order patrons) during weekdays for lunches and from 318 during weekdays to 521 on weekends (about half to each restaurant) for suppers. The average caloric consumptions from weekday breakfasts and suppers at the Lodge and weekend lunches at the Barbecue Ranch were less than one-third of men's daily needs. The iron, vitamin A, and niacin contents of the weekday breakfasts consume' at the Lodge and the iron in weekend breakfasts and vitamin A in all meals consumed in the Barbecue Ranch were less than one-third of daily allowances for these nutrients. Most of the meals consumed in the Barbecue Ranch contained less than 14.5% of the calories as protein and all of the meals, except lunches at the Lodge, contained more than 40% of the calories from fat. Vitamin A and iron contents of most meals in both facilities, niacin in breakfasts and ascorbic acid in suppers at the Lodge, and riboflavin in Barbecue Ranch suppers were low in relationship to the caloric contents of these meals.

The nutrients consumed at the 29-Burgers and Meating Place (Tables 11, 12, and 13) were above one-third of the daily allowances with the exception of vitamin A in weekend lunches at 29-Burgers. Average consumptions ranged from 1388 to 1817 kcal at 29-Burgers and 1162 to 1365 kcal at the Meating Place. The total headcounts for this dining hall (both restaurants) averaged from 206 for weekend lunches to 780 for weekday suppers with approximately half of the patrons eating in each restaurant. Weekday lunches at 29-Burgers contained only 13.6% of the calories as protein; calories from fat averaged over 40% for all meals served in this facility except for lunches at the Meating Place (38.7%). All of the meals consumed in both restaurants contained insufficient vitamin A and iron and most were low in thiamin when related to the caloric contents.

The third dining hall surveyed contained the Pasta Palace and the Sports Circle and these yielded the data summarized in Tables 14 through 16. This dining hall served averages of between 550 and 700 meals for all meal periods except weekend lunches when only brunch was offered and an average of 154 patrons were served. The average consumptions for all meals exceeded one-third of Marines' needs/allowances for all nutrients except for calories, iron, vitamin A, and niacin in the weekday breakfasts at the Pasta Palace; and vitamin A and thiamin in lunches at the Sports Circle. Except for lunches and the weekend breakfasts, all of the meals at the Pasta Palace and the brunch at the Sports Circle contained less than 14.5% of calories as protein. Fat contributed over 40% of the calories to all meals consumed in the Pasta Palace and to the weekday suppers in Sports Circle. In relationship to caloric intakes, low consumptions of the following nutrients were observed: vitamin A in all meals of both restaurants except for Pasta Palace suppers; thiamin in lunches and suppers in Pasta Palace and lunches in Sports Circle; niacin in all breakfasts/brunches of both dining halls and suppers at Pasta Palace; ascorbic acid in lunches and suppers in Sports Circle; and iron in all meals of both restaurants.

DISCUSSION

The first phase of this study was conducted prior to any changes in the Marine feeding system in order to obtain baseline data of nutrients consumed from different serving lines in the military dining hall and the attendance at each line. The nutritional status and the total daily nutrient intakes of each Marine are being reported elsewhere. These Marines appeared to represent two populations. First was the students and cadre for the Communications and Electronics School located at Twentynine Palms and second was the Force Troops and support group maintaining combat readiness. One dining hall provided meals to the school personnel while two others served Force Troops and other permanent personnel. Since there was an apriori assumption that these

two populations might differ substantially in their activities and, consequently, their nutritional needs and habits, one of the Force Troops dining halls and the student dining hall were studied during the first phase of the study.

The new feeding system instituted at Twentynine Palms Marine Corps Base included renovation of four dining halls to create eight restaurants. Each half of each dining hall had a distinct decor and the menus differed between the two restaurants in each dining facility. Three restaurants served modified 12-day cyclic A-ration menus, two served typical short-order foods, one served Italian foods, one had a steak house menu, and the last one served barbecued foods. Three dining halls were studied during phase two of the study in order to evaluate the nutritional contents of meals from each type of restaurant and to include both school personnel and Force Troops. Six days of A-ration menu and the barbecued foods were monitored in a Force Troops' dining hall, followed by a 5-day evaluation of the steak house and short order menu in a second dining hall in the Force Troops' area and finally the student dining hall serving A-ration (balance of the 12-day menu) and the Italian pasta menus was studied for 6 days. Each dining hall was monitored during both weekend days and for 3 to 4 weekdays.

The average nutrient consumptions from all of the meals served during the first phase of the Twentynine Palms study exceeded one-third of the Daily Nutrient Allowances with the exceptions of niacin in all breakfast meals and vitamin A in the breakfast at the student dining hall. After the menus had been changed, average caloric consumptions (Tables 8, 11, and 14) were less than one-third of men's needs at only weekday breakfast meals in the Lodge and Pasta Palace and weekday suppers in the Lodge. The consumptions contained less than one-third of the daily allowances for iron (weekday breakfasts at the Lodge and Pasta Palace and weekend lunches at the Barbecue Ranch), vitamin A (weekday breakfasts at the Lodge and Pasta Palace, all meals at the Barbecue Ranch, weekend lunches at 29-Burgers and weekday lunches at the Sports Circle) and niacin (weekday breakfasts at the Lodge and Pasta Palace). Three average meals consumed in either dining hall during the first phase of the study would provide at least a 20% excess of all nutrients including calories and as much as 150% excess of calcium and vitamin C. However, any woman eating only 2,200 kcal (estimated needs) per day with the average nutrient distribution would receive only between 70 and 80% of her allowances of iron and vitamin A. After initiating the restaurant concept of feeding, the consumptions from three average meals provided 98 (Lodge) to 135% (Pasta Palace) of men's caloric needs and similar quantities (comparable to those of the previous feeding system) of other nutrient intakes except for the Barbecue Ranch's meals which provided

only 75 and 101% of the daily allowances of vitamin A and iron, respectively. Women consuming 2,200 kcal per day would receive between 64 (Barbecue Ranch) and 70% (Lodge) of their iron and from 48 (Barbecue Ranch) to 90% (Pasta Palace) and 175% (Lodge) of their vitamin A allowances. Therefore, iron and vitamin A nutriture, especially for women, would be of concern in both the first and second phase feeding systems.

The caloric distribution in the intakes from the meals indicates protein contents were adequate for all meals served in the Force Troops Dining Hall and for all except weekend main suppers in the Student Dining Hall during the first phase of the study. After initiating the restaurants concept of feeding, the protein contribution to caloric intakes was low for women in weekday lunches and all suppers at the Barbecue Ranch, weekday lunches at 29-Burgers, weekday breakfasts and all suppers at the Pasta Palace, and weekend brunch at the Sports Circle. Not only was the protein content of these meals relatively low, but the fat content was excessive, especially in the two short-order type restaurants (Barbecue Ranch and 29-Burgers). Only the Sports Circle consistently served meals that provided consumptions containing near the goal of less than 40% of calories from fat, although lunches at the Lodge and Meating Place also provided less than 40% fat calories.

The calcium to phosphorus ratio was lower in the intakes from the restaurants and this was particularly noticeable for the two short-order restaurants and the steak house (Meating Place). This is the result of both reduced milk and calcium intakes and increased soft drinks and phosphorus intakes. Some of these ratios are approaching the lowest recommended values of 0.50 although the range for human adults has not been firmly established (3).

Examination of these consumption data as nutrient densities confirmed the low values for iron and vitamin A in the meals from the conventional feeding system during phase one but also revealed that niacin was low in most breakfasts, thiamin was low in weekday suppers in the Force Troops' Dining Hall and vitamin C was low in all suppers in the Student Dining Hall. The initiation of the restaurants for military feeding did not alleviate any of these potential problems and appears to have increased the incidence of meals with low contents of niacin, thiamin, vitamin C, and riboflavin (average riboflavin concentrations were adequate for all of the meals during phase one).

The objectives of designing and implementing a new feeding system at Twentynine Palms Marine Corps Base were to increase utilization by the patron and to improve the efficiency and economy of the operations. Although LAIR was requested to provide an evaluation of the impact of

changing feeding systems upon the nutritional intakes of the Marines, it is apparent that nutrition received only superficial attention when the menus were prepared for the restaurants of the new feeding system. If we could get enlisted personnel to increase their utilization of the military dining halls, their nutrition could be improved by education for better food selection, fortification with micronutrients to assure adequate intakes and/or more appealing preparation and presentation of the more nutritious foods. However, none of our data (dining hall headcounts in relationship to base population or dietary diary) indicate any increase in dining hall utilization. It appears that the nutrition of the Marine was worse and his/her utilization of the facility had not increased. The efficiency and economy of operations were not analyzed by our study.

The enlisted Marine's average daily consumption is between two and two-and-one-half meals per day and from one to one-and-one-half of these meals are consumed in the military dining hall (4). This is comparable to observations obtained during other recent surveys. Since the average Marine eats only one to one-and-one-half meals and less than 10% eat three meals/day in the dining hall, his/her daily nutrient intakes can not be evaluated from the total nutrients in three dining hall meals. Also, since the average person eats between 2 and 2.5 meals/day from all sources, one meal from the dining hall should account for 40 to 50% of the total daily intake instead of one-third of the intake. Therefore, intakes of 1300 to 1800 kcal/meal as observed appear reasonable. The importance of nutrient density and the adequacy of micronutrient concentrations in military dining halls have increased since previous studies have shown that nutrient densities of micronutrients are less in foods that military persons eat from other sources than are present in military dining hall foods (4,5).

CONCLUSIONS

A before-and-after study was conducted to compare the nutritional adequacy of meals consumed in the dining halls of the conventional Marine feeding system to those eaten in a restaurant concept of military feeding in which different serving lines have distinct decors and menus. Meals consumed from the conventional system provided at least one-third of the Marines' caloric needs and nutrient allowances with the exceptions of vitamin A (Student Dining Hall breakfasts) and niacin (breakfasts at both dining halls). Based upon nutrient densities or evaluating quantities of nutrients per 1,000 kcal revealed that women's protein allowances and both men's and women's vitamin A and iron allowances would not be fulfilled without the consumption of an overabundance of calories. Concentrations of thiamin were also borderline in several of

the meals. After initiating the new feeding system, caloric intakes exceeded one-third of men's needs at all meals surveyed except Lodge and Pasta Palace breakfasts and Barbecue Ranch weekend brunches. Iron, vitamin A, and niacin intakes were less than one-third of allowances for several meals. Nutrient density calculations indicated that the majority of the meals contained low concentrations of iron and vitamin A, several had low levels of thiamin and niacin and some were low in riboflavin and ascorbic acid. The majority of the meals consumed during both the first and second phases of the Twentynine Palms Dining Hall study contained excessive levels of fat, as much as 47% of the calories. These data suggest that the meals consumed in the military dining halls of the conventional Marine feeding system contained less than recommended allowances for some of the micronutrients and the nutritional quality of the meals consumed from the dining facilities of the new system were even worse.

RECOMMENDATIONS

- Increase the availability of foods that are good sources of iron, vitamin A, thiamin, riboflavin, vitamin C, and niacin.

- Reduce the amount of fat present in the menu, especially in the Barbecue Ranch and 29-Burgers.

- Increase nutrition awareness and nutrition education for the Marine.

- Consider nutrient fortification of certain foods to increase micronutrient intakes or provide nutritional supplements of vitamin A and iron, especially for female Marines.

- Monitor the nutritional status of the Marines to ascertain the degree of the detrimental effects of these diets upon physical and mental performance.

- Improve the quality of preparation of good nutritious foods in the military through better training and career opportunities for food service personnel.

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TABLE 1. Daily Dietary Nutrient Allowances (2) and Per Meal Standards

Nutrient	Men	Women	Per Man Meal
Calories (kcal)	3200	2200	1067
Protein (gm)	100	80	33.3
Fat (% of kcal)		Not to exceed 40%	
Calcium (mg)	800	800	267
Iron (mg)	18	18	6
Vitamin B_1, Thiamin (mg)	1.6	1.1	0.53
Vitamin B_2, Riboflavin (mg)	2.0	1.4	0.67
Niacin (mg)	21	15	7
Vitamin C, Ascorbic Acid (mg)	60	60	20
Vitamin A (IU)	5000	5000	1667
Vitamin A, IU/kcal	1.56	2.27	
Thiamin, mg/1000 kcal	0.50	0.50	
Riboflavin, mg/1000 kcal	0.625	0.636	
Niacin, mg/1000 kcal	6.56	6.82	
Ascorbic Acid, mg/1000	18.75	27.27	
Iron, mg/1000 kcal	5.62	8.18	

TABLE 2. Average Macronutrient Consumptions From Meals Served in the Force Troops' Dining Hall

Meal	No. of Meals	Headcount AVG	Headcount SD	Energy AVG	Energy SD	Protein AVG	Protein SD	Fat AVG	Fat SD	Carbohydrate AVG	Carbohydrate SD
				kcal		gm		gm		gm	
Breakfast											
Weekdays	6	369	41	1199	45	47.7	3.9	61.5	2.2	118.5	7.1
Weekends	2	373	22	1490	77	57.8	0.8	76.7	3.8	147.0	10.2
All	8	370	36	1272	143	50.2	5.7	65.3	7.5	125.6	15.0
Lunch											
Weekdays	6	472	32	1258	71	49.6	3.7	61.5	6.4	131.3	6.0
Supper											
Weekdays	6	400	97	1345	66	55.6	4.5	68.3	7.9	129.8	8.8
Weekends	2	306	49	1470	73	59.9	0.7	78.7	12.0	136.2	10.8
All	8	377	94	1376	85	56.7	4.3	70.9	9.4	131.4	9.0
Lunch - Main											
Weekdays	6	298	15	1154	136	44.5	5.5	53.7	9.0	126.9	17.2
Lunch - Short Order											
Weekdays	6	175	26	1452	262	58.1	10.6	75.2	14.8	141.9	28.1
Supper - Main											
Weekdays	6	252	72	1293	127	55.2	5.6	64.6	12.9	123.1	11.6
Weekends	2	209	31	1301	103	56.3	0.1	69.2	17.5	118.1	17.1
All	8	242	66	1295	114	55.5	4.7	65.7	12.9	121.8	12.0
Supper - Short Order											
Weekdays	6	148	36	1432	170	56.2	5.8	73.3	7.2	142.9	27.9
Weekends	2	99	18	1826	0	67.5	2.6	98.9	0.1	174.2	1.3
All	8	136	38	1530	232	59.0	7.2	79.7	13.3	150.6	27.7

TABLE 3. Average Micronutrient Consumptions From Meals Served in the Force Troops' Dinning Hall

Meal	Calcium AVG	Calcium SD	Iron AVG	Iron SD	Vitamin A AVG	Vitamin A SD	Thiamin AVG	Thiamin SD	Riboflavin AVG	Riboflavin SD	Niacin AVG	Niacin SD	Ascorbic AVG	Ascorbic SD
	mg		mg		IU		mg		mg		mg		mg	
Breakfast														
Weekdays	728	60	6.5	0.6	1700	148	0.64	0.04	1.37	0.10	5.4*	0.9	43	11
Weekends	854	110	8.3	0.0	2201	36	0.81	0.04	1.57	0.13	7.5	0.6	51	1
All	760	88	7.0	1.0	1825	264	0.68	0.09	1.42	0.13	5.9*	1.3	45	10
Lunch														
Weekdays	663	60	7.1	0.7	2507	823	0.78	0.16	1.20	0.10	9.0	1.0	65	9
Supper														
Weekdays	668	84	7.8	1.1	1928	468	0.72	0.10	1.20	0.09	10.6	2.2	53	11
Weekends	653	67	8.9	0.5	4911	1041	1.15	0.55	1.29	0.03	12.0	1.0	61	10
All	664	76	8.1	1.1	2674	1489	0.83	0.30	1.23	0.08	10.9	2.0	55	11
Lunch - Main														
Weekdays	610	40	6.4	1.0	2816	1222	0.77	0.26	1.17	0.16	8.1	0.5	69	16
Lunch - Short Order														
Weekdays	720	85	8.4	1.6	2063	210	0.78	0.16	1.26	0.13	11.0	3.5	60	15
Supper - Main														
Weekdays	651	104	7.8	1.4	2001	717	0.63	0.09	1.18	0.11	10.1	3.3	46	10
Weekends	584	68	8.6	0.6	6185	1280	1.23	0.80	1.21	0.01	11.0	0.9	50	3
All	634	97	8.0	1.3	3047	2086	0.78	0.42	1.19	0.09	10.3	2.9	47	9
Supper - Short Order														
Weekdays	663	76	8.0	1.2	1846	265	0.82	0.14	1.23	0.12	11.5	1.4	65	22
Weekends	799	71	9.7	0.4	2139	344	0.98	0.03	1.46	1.12	14.0	1.2	84	29
All	697	94	8.4	1.3	1920	292	0.86	0.14	1.28	0.16	12.1	1.7	70	23

*Less than one-third of men's daily allowances (7 mg).

TABLE 4. Average Caloric Distributions and Nutrient Densities of Meals Consumed in the Force Troops' Dining Hall

Meal	Percent of Calories From			Ca:P Ratio	Vitamin A IU/kcal	Milligrams per 1,000 kcalories				
	Protein	Fat	Carbohydrate			Thiamin	Riboflavin	Niacin	Ascorbic Acid	Iron
Breakfast										
Weekdays	15.7	45.4[1]	38.9	0.81	1.42[2]	0.53	1.14	4.47[5]	35.79	5.42[6]
Weekends	15.3	45.7[1]	38.9	0.79	1.48[2]	0.54	1.05	5.03[5]	34.02	5.57[6]
All	15.6	45.5[1]	38.9	0.80	1.43[2]	0.53	1.11	4.64[5]	32.27	5.50[6]
Lunch										
Weekdays	15.5	43.3[1]	41.1	0.79	1.99[3]	0.62	0.96	7.19	51.30	5.64[7]
Supper										
Weekdays	16.4	45.3[1]	38.3	0.73	1.43[2]	0.53	0.90	7.84	39.25	5.80[7]
Weekends	16.1	47.4[1]	36.5	0.67	3.34[3]	0.78	0.88	8.15	41.79	6.05[7]
All	16.3	45.9[1]	37.8	0.71	1.94[3]	0.60	0.89	7.93	39.93	5.89[7]
Lunch - Main										
Weekdays	15.2	41.3[1]	43.4	0.08	2.44	0.67	1.01	7.03	59.63	5.55[6]
Lunch - Short Order										
Weekdays	15.8	45.8[1]	38.4	0.76	1.42[2]	0.54	0.86	7.56	41.31	5.79[7]
Supper - Main										
Weekdays	17.1	44.9[1]	38.0	0.72	1.55[2]	0.49[4]	0.91	7.81	35.87	6.03[7]
Weekends	17.1	47.2[1]	35.8	0.66	4.75	0.95	0.93	8.47	38.21	6.61[7]
All	17.1	45.5[1]	37.5	0.70	2.35	0.61	0.92	7.98	36.45	6.18[7]
Supper - Short Order										
Weekdays	15.4	45.3[1]	39.3	0.73	1.29[2]	0.57	0.86	8.00	45.63	5.59[6]
Weekends	14.5	47.9[1]	37.5	0.69	1.17[2]	0.54	0.80	7.65	45.80	5.31[6]
All	15.2	46.1[1]	38.8	0.72	1.25[2]	0.56	0.84	7.90	45.68	5.49[6]

[1] > 40% maximum that is recommended in AR 40-25. [2] < 2.27 IU/kcal standard for women and 1.56 IU/kcal for men. [3] < 2.27 IU/kcal standard for women. [4] < 0.5 mg/1000 kcal standard for men and women. [5] < 6.56 and 6.82 mg/1000 kcal standards for men and women, respectively. [6] < 5.62 and 8.18 mg/1000 kcal standard for men and women, respectively. [7] < 8.18 mg/1000 kcal standard for women.

TABLE [illegible]

[illegible]	[illegible]
Breakfast	
Weekdays	[illegible]
Weekends	[illegible]
All	[illegible]
Lunch	
Weekdays	[illegible]
Supper	
Weekdays	[illegible]
Weekends	[illegible]
All	[illegible]
Breakfast - Main	
Weekdays	[illegible]
Weekends	[illegible]
All	[illegible]
Breakfast - Short order	
Weekends	[illegible]
Lunch - Main	
Weekdays	[illegible]
Lunch - Short order	
Weekdays	[illegible]
Supper - Main	
Weekdays	[illegible]
Weekends	[illegible]
All	[illegible]
Supper - Short order	
Weekdays	[illegible]
Weekends	[illegible]
All	[illegible]

TABLE 6. Average Micronutrient Consumptions From Meals Served in the Students' Dining Hall

Meal	Calcium AVG	Calcium SD	Iron AVG	Iron SD	Vitamin A AVG	Vitamin A SD	Thiamin AVG	Thiamin SD	Riboflavin AVG	Riboflavin SD	Niacin AVG	Niacin SD	Ascorbic AVG	Ascorbic SD
	mg		mg		IU		mg		mg		mg		mg	
Breakfast														
Weekdays	613	40	7.1	0.4	1609*	139	0.67	0.03	1.20	0.06	6.4†	0.3	46	13
Weekends	523	25	7.4	0.9	1567*	70	0.67	0.06	1.09	0.03	8.3	0.1	59	13
All	588	48	7.2	0.5	1597*	119	0.67	0.04	1.17	0.07	6.9†	1.0	49	14
Lunch														
Weekdays	611	65	7.4	0.7	2597	889	0.76	0.11	1.12	0.13	9.4	0.4	58	8
Supper														
Weekdays	653	65	7.9	0.9	2147	926	0.73	0.09	1.14	0.09	10.1	1.8	42	9
Weekends	681	77	7.8	0.0	2720	914	0.82	0.27	1.20	0.16	10.0	0.1	44	4
All	661	64	7.9	0.7	2311	888	0.76	0.14	1.16	0.10	10.1	1.4	43	7
Breakfast - Main														
Weekdays	613	21	7.1	0.4	1609*	139	0.67	0.03	1.20	0.06	6.4†	0.3	46	13
Weekends	498	48	6.9	1.2	1531*	145	0.59	0.01	1.08	0.07	7.0	0.7	49	6
All	581	62	7.0	0.6	1587*	133	0.65	0.05	1.17	0.08	6.6†	0.5	47	11
Breakfast - Short Order														
Weekends	620	53	9.7	0.1	1703	235	0.97	0.24	1.12	0.15	14.1	1.6	100	38
Lunch - Main														
Weekdays	525	74	6.8	1.2	3237	1606	0.70	0.21	1.06	0.16	7.9	0.6	58	9
Lunch - Short Order														
Weekdays	637	72	7.9	0.3	1983	279	0.79	0.06	1.16	0.11	10.8	0.6	61	17
Supper - Main														
Weekdays	631	73	7.3	1.5	2251	1142	0.67	0.25	1.10	0.13	9.0	2.7	27	6
Weekends	560	36	7.2	0.1	2963	1263	0.82	0.48	1.06	0.12	8.7	0.5	30	3
All	610	71	7.3	1.3	2455	1120	0.71	0.29	1.09	0.12	8.9	2.2	27	5
Supper - Short Order														
Weekdays	634	71	8.7	1.3	1924	636	0.80	0.10	1.16	0.13	11.5	1.7	66	17
Weekends	730	76	8.6	0.7	2141	120	0.85	0.06	1.32	0.13	11.8	1.6	64	-
All	661	81	8.7	1.1	1986	532	0.82	0.09	1.20	0.14	11.6	1.6	65	14

* Less than one-third of men's and women's daily allowances (1667 IU).
† Less than one-third of men's daily allowances (7 mg).

TABLE 1. Stem-

Meal										
Breakfast										
Weekdays										
Weekends										
All										
Lunch										
Weekdays										
Supper										
Weekdays										
Weekends										
All	14.9	43.6								
Breakfast - Main										
Weekdays	15.1									
Weekends										
All	15.1	40.9								
Breakfast - Short Order										
Weekend										
Lunch - Main										
Weekdays										
Lunch - Short Order										
Weekdays										
Supper - Main										
Weekdays										
Weekends										
All										
Supper - Short Order										
Weekdays										
Weekends										
All										

[illegible]

TABLE 6. Average Macronutrient Consumptions From Meals Served in the Lodge and Barbecue Ranch

Meal	No.of Meals	Headcount AVG	Headcount SD	Energy AVG	Energy SD	Protein AVG	Protein SD	Fat AVG	Fat SD	Carbohydrate AVG	Carbohydrate SD
				kcal		gm		gm		gm	
Lodge Dining Hall/A-ration menu											
Breakfast											
Weekdays	4	414	60	923*	52	38.3	2.9	47.4	1.2	87.8	14.2
Weekends	2	396	74	1067	112	45.0	5.7	49.9	4.6	111.4	13.7
All	6	408	58	971*	98	40.5	4.9	48.2	2.6	95.7	17.5
Lunch											
Weekdays	4	195	18	1078	225	53.2	16.5	47.4	12.3	113.6	32.7
Supper											
Weekdays	5	164	30	1049*	115	52.1	11.9	49.6	6.3	100.3	9.1
Weekends	2	248	21	1165	91	49.5	7.5	58.7	11.4	112.4	7.9
All	7	188	49	1082	116	51.4	10.2	52.2	8.2	103.8	10.0
Barbecue Ranch/Short order menu											
Lunch											
Weekdays	4	245	35	1248	73	44.7	4.1	64.8	4.4	127.5	6.9
Weedends	2	76	40	1027*	83	40.3	7.0	52.6	9.3	99.0	8.4
All	6	189	93	1174	133	43.3	5.0	60.7	8.3	118.0	16.0
Supper											
Weekdays	5	154	23	1302	106	45.1	6.4	69.2	7.5	130.1	3.7
Weekends	2	273	42	1349	35	43.7	2.3	72.0	0.6	137.6	7.4
All	7	186	63	1315	91	44.7	5.3	70.0	6.3	132.3	5.7

*Less than one-third of men's daily needs.

TABLE 6. Average Micronutrient Consumptions From Meals Served in the Lodge and Barbecue Ranch

Meal	Calcium AVG	Calcium SD	Iron AVG	Iron SD	Vitamin A AVG	Vitamin A SD	Thiamin AVG	Thiamin SD	Riboflavin AVG	Riboflavin SD	Niacin AVG	Niacin SD	Ascorbic AVG	Ascorbic SD
	mg		mg		IU		mg		mg		mg		mg	
Lodge Dining Hall/A-ration menu														
Breakfast														
Weekdays	579	78	4.6*	0.5	1467*	280	0.58	0.07	1.12	0.16	4.8*	0.6	36	21
Weekends	561	71	7.5	1.4	2122	344	0.80	0.12	1.31	0.21	8.4	1.6	75	5
All	573	69	5.7*	1.6	1685	430	0.65	0.14	1.18	0.18	6.0†	2.1	49	26
Lunch														
Weekdays	449	80	8.0	2.0	8425	9631	1.05	0.50	1.34	0.82	11.3	4.0	36	4
Supper														
Weekdays	516	141	6.4	1.7	2395	1454	0.56	0.20	1.07	0.27	9.0	2.0	28	10
Weekends	637	305	7.1	0.7	2277	586	0.68	0.14	1.08	0.09	7.8	3.5	30	10
All	550	180	6.6	1.4	2361	1213	0.60	0.18	1.07	0.22	8.7	2.3	28	9
Barbecue Ranch/Short-order menu														
Lunch														
Weekdays	361	59	7.1	0.7	1138*	228	0.72	0.13	0.79	0.12	10.5	1.1	49	7
Weekends	332	93	5.6*	1.2	500*	15	0.54	0.00	0.70	0.07	8.6	1.5	33	10
All	351	64	6.6	1.1	925*	374	0.66	0.14	0.76	0.11	9.9	1.4	43	11
Supper														
Weekdays	352	51	6.8	0.9	1126*	183	0.74	0.15	0.78	0.11	10.7	1.7	52	9
Weekends	402	37	7.1	0.3	1236*	97	0.76	0.09	0.84	0.07	9.9	0.5	54	4
All	367	50	6.9	0.7	1157*	163	0.75	0.13	0.80	0.10	10.5	1.5	52	7

* Less than one-third of men's and women's daily allowances (6 mg of iron; 1667 IU of vitamin A; 7 and 5 mg of niacin, respectively).

† Less than one-third of men's daily allowances (7 mg of niacin).

TABLE 10. Average Caloric Distributions and Nutrient Densities of Meals Consumed -Lodge and Barbecue Ranch

Meal	Percent of Calories from Protein	Fat	Carbohydrate	Ca:P Ratio	Vitamin A IU/kcal	Milligrams per 1,000 kcalories Thiamin	Riboflavin	Niacin	Ascorbic Acid	Iron
Lodge Dining Hall/A-ration menu										
Breakfast										
Weekdays	16.4	45.8[2]	37.7	0.84	1.59[3]	0.63	1.22	5.22[6]	38.48	5.20[9]
Weekends	16.8	41.8[2]	41.5	0.76	1.99[3]	0.75	1.22	7.87	70.77	7.03[8]
All	16.6	44.4[2]	39.1	0.81	1.74[3]	0.67	1.22	6.19[6]	50.31	5.87[8]
Lunch										
Weekdays	19.4	39.0	41.6	0.57	7.82	0.97	1.25	10.46	32.96	7.42[8]
Supper										
Weekdays	19.7	42.3[2]	38.0	0.70	2.28[3]	0.54	1.02	8.62	26.67[7]	6.10[8]
Weekends	16.8	45.0[2]	38.2	0.72	1.96[3]	0.58	0.93	6.70	25.38[7]	6.09[8]
All	18.8	43.1[2]	38.1	0.71	2.18[3]	0.55	0.99	8.03	26.28[7]	6.10[8]
Barbecue Ranch/Short-order menu										
Lunch										
Weekdays	14.1[1]	45.9[2]	40.1	0.51	0.91[4]	0.58	0.64	8.40	38.96	5.69[8,9]
Weekends	15.6	46.0[2]	38.4	0.58	0.49[4]	0.53	0.68	8.42	32.25	5.45[8]
All	14.5	45.9[2]	39.6	0.53	0.79[4]	0.56	0.65	8.40	37.00	5.62[8]
Supper										
Weekdays	13.6[1]	47.1[2]	39.3	0.51	0.86[4]	0.57	0.60[5]	8.22	39.72	5.22[9]
Weekends	12.7[1]	47.2[2]	40.1	0.56	0.92[4]	0.57	0.62[5]	7.37	39.86	5.26[9]
All	13.4[1]	47.1[2]	39.5	0.52	0.88[4]	0.57	0.61[5]	7.97	39.76	5.25[9]

[1] < 14.5% required by women to obtain protein allowances without exceeding caloric needs. [2] > 40% maximum that is recommended in AR 40-25. [3] < 2.27 IU/kcal standard for women. [4] < 1.56 IU/kcal standard for men as well as 3 above. [5] < 0.625 and 0.636 mg/1000 kcal standards for men and women, respectively. [6] < 6.56 and 6.82 mg/1000 kcal standards for men and women, respectively. [7] < 27.3 mg/1000 kcal standard for women. [8] < 8.18 mg/1000 kcal standard for women. [9] < 5.62 mg/1000 kcal standard for men, as well as 8 above.

TABLE 11. Average Macronutrient Consumptions From Meals Served in the 29-Burgers and Meating Place

Meal	No. of Meals	Headcount AVG	Headcount SD	Energy AVG	Energy SD	Protein AVG	Protein SD	Fat AVG	Fat SD	Carbohydrate AVG	Carbohydrate SD
				Kcal		gm		gm		gm	
29-Burgers/Short-order menu											
Lunch											
Weekdays	3	257	57	1513	115	52.0	5.4	77.4	7.5	156.6	13.3
Weekends	2	206	28	1467	71	56.4	3.1	74.9	3.3	144.8	8.7
All	5	236	51	1495	92	53.8	4.7	76.4	5.7	151.9	12.2
Supper											
Weekdays	3	395	47	1388	83	53.0	2.6	68.9	5.3	142.4	7.3
Weekends	2	262	59	1817	88	68.6	0.6	94.3	2.2	177.4	17.3
All	5	342	85	1560	246	59.2	8.8	79.1	14.5	156.4	21.6
Meating Place/Steak house menu											
Breakfast											
Weekends	2	331	16	1164	52	45.7	0.5	61.3	0.7	110.3	13.7
Lunch											
Weekdays	3	251	11	1294	118	49.5	3.7	56.3	3.1	150.9	19.4
Supper											
Weekdays	3	385	82	1162	114	43.8	1.9	53.7	7.0	127.7	14.8
Weekends	2	286	49	1365	84	54.0	2.1	64.7	0.9	144.3	23.8
All	5	345	83	1243	144	47.9	5.8	58.1	7.8	134.3	18.3

TABLE 12. Average Micronutrient Consumptions From Meals Served in the 29 - Burgers and Meating Place

Meal	Calcium AVG	Calcium SD	Iron AVG	Iron SD	Vitamin A AVG	Vitamin A SD	Thiamin AVG	Thiamin SD	Riboflavin AVG	Riboflavin SD	Niacin AVG	Niacin SD	Ascorbic AVG	Ascorbic SD
	mg		mg		IU		mg		mg		mg		mg	
29 Burgers/Short-order menu														
Lunch														
Weekdays	567	75	7.9	0.7	2048	778	0.72	0.11	1.09	0.15	10.2	1.4	46	14
Weekends	630	70	8.5	0.8	1328*	524	0.82	0.12	1.22	0.17	11.5	1.0	49	5
All	592	72	8.1	0.7	1760	726	0.76	0.11	1.14	0.16	10.8	1.3	48	10
Supper														
Weekdays	517	28	7.6	0.7	2041	538	0.68	0.10	1.01	0.07	11.4	0.6	48	6
Weekends	651	29	10.4	0.4	2589	600	0.90	0.12	1.27	0.08	14.3	1.2	57	12
All	571	77	8.7	1.6	2260	570	0.77	0.15	1.11	0.15	12.5	1.7	52	9
Meating Place/Steak house menu														
Breakfast														
Weekends	726	28	6.7	0.4	2134	328	0.78	0.06	1.46	0.07	7.4	0.7	37	3
Lunch														
Weekdays	471	69	7.0	0.8	2231	261	0.65	0.11	1.02	0.20	10.6	0.8	51	10
Supper														
Weekdays	462	89	6.3	1.0	1828	159	0.62	0.14	0.97	0.09	9.3	0.8	42	4
Weekends	430	13	8.0	0.0	2320	348	0.61	0.00	0.98	0.02	12.1	0.7	42	3
All	449	66	7.0	1.2	2025	340	0.61	0.10	0.97	0.06	10.4	1.7	42	3

* Less than one-third of men's and women's daily allowances (1667 IU of vitamin A).

TABLE 13. Average Caloric Distributions and Nutrient Densities of Meals Consumed by 6-8 Burgers and Meating Place

Meal	Percent of Calories From: Protein	Fat	Carbohydrate	Ca:P Ratio	Vitamin A IU/kcal	Milligrams per 1,000 kcalories: Thiamin	Riboflavin	Niacin	Ascorbic Acid	Iron
39-Burgers/Short-order menu										
Lunch										
Weekdays	13.6[1]	45.5[2]	40.9	0.68	1.35[4]	0.47[5]	0.72	6.77	31.53	5.22[8][7]
Weekends	15.3[1]	45.6[2]	39.2	0.70	0.91[4]	0.56	0.83	7.86	33.83	5.79[8]
All	14.2[1]	45.5[2]	40.2	0.69	1.18[4]	0.51	0.76	7.20	33.20	5.42[8]
Supper										
Weekdays	15.1	44.2[2]	40.6	0.62	1.47[4]	0.49[5]	0.73	8.20	34.41	5.48[6][7]
Weekends	15.0	46.3[2]	38.7	0.62	1.42[4]	0.50[5]	0.70	7.84	31.50	5.72[7]
All	15.1	45.2[2]	39.7	0.62	1.45[4]	0.49[5]	0.71	8.03	33.06	5.58[8]
Meating Place/Steak house menu										
Breakfast										
Weekends	15.5	46.9[2]	37.5	0.87	1.83[3]	0.67	1.25	6.33[6]	31.50	5.76[7]
Lunch										
Weekdays	15.1	38.7	46.1	0.62	1.72[3]	0.50	0.79	8.20	39.52	5.41[8]
Supper										
Weekdays	15.0	41.3[2]	43.7	0.66	1.57[3]	0.53[5]	0.83	8.01	35.92	5.42[8][7]
Weekends	15.7	42.3[2]	42.0	0.56	1.70[3]	0.44[5]	0.72	8.86	31.00	5.86[7]
All	15.3	41.8[2]	42.9	0.62	1.63[3]	0.49[5]	0.78	8.39	33.76	5.63[7]

[1] < 14.5% required by women to obtain protein allowances without exceeding caloric needs. [2] > 40% maximum that is recommended in AB 40-25. [3] < 2.27 IU/kcal standard for women. [4] < 1.56 IU/kcal standard for men, as well as 3 above. [5] < 0.5 mg/1000 kcal standard for both men and women. [6] < 6.56 and 6.82 mg/1000 kcal standards for men and women, respectively. [7] < 8.18 mg/1000 kcal standard for women. [8] < 5.62 mg/1000 kcal standard for men, as well 7 as above.

TABLE 14. Average Macronutrient Consumptions From Meals Served in the Pasta Palace and Sports Circle

Meal	No. of Meals	Headcount AVG	Headcount SD	Energy AVG	Energy SD	Protein AVG	Protein SD	Fat AVG	Fat SD	Carbohydrate AVG	Carbohydrate SD
				kcal		gm		gm		gm	
Pasta Palace/Ethnic (Italian) menu											
Breakfast											
Weekdays	4	682	14	1012*	26	35.1	1.7	46.7	3.9	115.2	11.3
Weekends	2	554	42	1266	108	46.4	0.8	57.9	2.2	143.2	20.0
All	6	639	70	1096	141	38.8	6.0	50.4	6.6	124.5	19.2
Lunch											
Weekdays	4	263	28	1648	124	61.5	5.0	80.3	9.7	173.6	7.3
Supper											
Weekdays	4	186	75	1623	165	55.2	9.3	77.2	16.3	181.4	5.8
Weekends	2	294	100	1479	38	49.7	4.2	67.8	5.0	170.7	3.3
All	6	222	92	1575	155	53.4	8.0	74.0	13.7	177.8	7.3
Sports Circle/A-ration menu											
Brunch											
Weekends	2	154	80	1582	69	45.5	6.1	70.4	6.4	198.2	24.8
Lunch											
Weekdays	4	463	68	1249	177	50.4	11.1	55.7	3.9	139.9	25.1
Supper											
Weekdays	4	386	31	1126	78	44.6	9.1	51.5	3.3	123.6	5.9
Weekends	2	384	161	1237	127	48.1	9.3	53.2	6.2	140.2	1.7
All	6	385	76	1163	101	45.8	8.4	52.1	3.9	129.1	9.7

* Less than one-third of men's daily needs.

TABLE 15. Average Micronutrient Consumptions From Meals Served in the Pasta Palace and Sports Circle

Meal	Calcium AVG	Calcium SD	Iron AVG	Iron SD	Vitamin A AVG	Vitamin A SD	Thiamin AVG	Thiamin SD	Riboflavin AVG	Riboflavin SD	Niacin AVG	Niacin SD	Ascorbic AVG	Ascorbic SD
	mg		mg		mg		mg		mg		mg		mg	
Pasta Palace/Ethnic (Italian) menu														
Breakfast														
Weekdays	546	23	5.4*	0.4	1371*	165	0.59	0.07	1.10	0.10	5.3†	1.2	42	11
Weekends	682	32	7.1	0.6	2042	469	0.79	0.11	1.49	0.16	7.9	0.5	45	3
All	591	74	5.9*	1.0	1595*	425	0.66	0.13	1.23	0.23	6.2†	1.7	43	9
Lunch														
Weekdays	709	34	8.2	0.7	3136	568	0.77	0.04	1.28	0.04	10.9	1.0	49	6
Supper														
Weekdays	720	129	7.9	1.5	4147	606	0.77	0.12	1.20	0.13	9.8	2.0	46	7
Weekends	682	39	7.1	0.3	4035	270	0.71	0.05	1.17	0.03	8.2	0.2	52	5
All	708	103	7.6	1.2	4110	488	0.75	0.10	1.19	0.10	9.2	1.7	48	6
Sports Circle/A-ration menu														
Brunch														
Weekend	508	28	7.6	2.4	1947	129	0.81	0.21	1.13	0.12	9.9	2.9	84	16
Lunch														
Weekdays	460	61	7.3	1.4	1447*	264	0.52†	0.08	0.95	0.11	8.6	1.8	25	6
Supper														
Weekdays	434	107	6.3	0.6	1813	864	0.69	0.27	0.90	0.16	8.2	1.5	26	12
Weekends	525	59	7.4	1.5	2267	314	0.74	0.08	1.04	0.06	9.9	3.1	32	5
All	465	99	6.7	1.0	1965	723	0.70	0.21	0.95	0.15	8.8	2.0	28	10

* Less than one-third of men's and women's daily allowances (7 mg of iron; 1667 IU of vitamin A).
† Less than one-third of men's daily allowances (0.53 mg of thiamin; 7 mg of niacin).

TABLE 16. Average Caloric Distributions and Nutrient Densities of Meals - Pasta Palace and Sports Circle

Meal	Percent of Calories From			Ca:P Ratio	Vitamin A IU/kcal	Milligrams per 1,000 kcalories				
	Protein	Fat	Carbohydrate			Thiamin	Riboflavin	Niacin	Ascorbic Acid	Iron
Pasta Palace/Ethnic (Italian) menu										
Breakfast										
Weekdays	13.7[1]	41.2[2]	45.1	0.82	1.36[4]	0.59	1.08	5.24[6]	41.09	5.34[9]
Weekends	14.5[1]	40.7[2]	44.8	0.83	1.61[4]	0.62	1.18	6.27[6]	35.70	5.61[9]
All	14.0[1]	41.0[2]	45.0	0.83	1.45[4]	0.60	1.12	5.64[6]	39.02	5.38[9]
Lunch										
Weekdays	14.8	43.5[2]	41.7	0.74	1.90[3]	0.47[5]	0.77	6.60	29.99	4.98[9]
Supper										
Weekdays	13.5[1]	42.3[2]	44.2	0.80	2.56	0.48[5]	0.74	6.02[6]	28.25	4.87[9]
Weekends	13.3[1]	40.9[2]	45.8	0.85	2.73	0.48[5]	0.79	5.55[6]	34.85	4.60[9]
All	13.4[1]	41.9[2]	44.7	0.81	2.61	0.48[5]	0.76	5.87[6]	30.31	4.83[9]
Sports Circle/A-ration menu										
Brunch										
Weekend	11.3[1]	39.4	49.3	0.67	1.23[4]	0.51	0.71	6.25[6]	53.16	4.80[9]
Lunch										
Weekdays	16.0	39.7	44.3	0.60	1.16[4]	0.41[5]	0.76	6.69	19.87[7]	5.84[8]
Supper										
Weekdays	15.7	40.8[2]	43.5	0.63	1.61[3]	0.61	0.80	7.31	23.24[7]	5.60[9]
Weekends	15.6	38.9[2]	45.5	0.65	1.83[3]	0.59	0.84	7.97	25.59[7]	5.96[8]
All	15.7	40.1[2]	44.2	0.64	1.69[3]	0.60	0.82	7.55	24.07[7]	5.76[8]

[1] < 14.5% required by women to obtain protein allowances without exceeding caloric needs. [2] > 40% as recommended in AR 40-25. [3] < 2.27 IU/kcal standard for women. [4] < 1.56 IU/kcal standard men, as well as 3 above. [5] < 0.5 mg/1000 kcal standard for both men and women. [6] < 6.56 and 6.82 mg/1000 kcal standards for men and women, respectively. [7] < 27.3 mg/1000 kcal standard for women. [8] < 8.18 mg/1000 kcal standard for women. [9] < 5.62 mg/1000 kcal standard for men, as well as 8 above.

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